

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
23 August 2001 (23.08.2001)

PCT

(10) International Publication Number
WO 01/61148 A3

(51) International Patent Classification⁷: E21B 37/08,
37/06

TIBBLES, Raymond, J.; 3511 Battle Creek Drive, Missouri City, TX 77459 (US). KELKAR, Shrihari; 10502 Fountain Lake Drive, Apt. 1326, Stafford, TX 77477 (US). BRADY, Mark, E.; 826 Featherbrook Court, Sugar Land, TX 77479 (US). MORRIS, Elizabeth, W.A.; 137, Blenheim Place, Aberdeen, Grampian AB25 2DL (GB).

(21) International Application Number: PCT/EP01/01697

(74) Agent: MENES, Catherine; Etudes & Productions Schlumberger, 26, rue de la Cavée, B.P. 202, F-92142 Clamart Cédex (FR).

(22) International Filing Date: 15 February 2001 (15.02.2001)

(81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW only: SOFITECH N.V. [BE/BE]; 140 Rue de Stalle, B-1180 Brussels (BE).

(25) Filing Language: English

(84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

(26) Publication Language: English

Published:

— with international search report

(30) Priority Data:
60/183,200 17 February 2000 (17.02.2000) US

(88) Date of publication of the international search report:
21 March 2002

(71) Applicant (for AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW only): SOFITECH N.V. [BE/BE]; 140 Rue de Stalle, B-1180 Brussels (BE).

(71) Applicant (for CA only): SCHLUMBERGER CANADA LIMITED [CA/CA]; Eau Claire Place I, 525 - 3rd Avenue, SW, Alberta T2P 004 (CA).

(71) Applicant (for FR only): COMPANIE DES SERVICES DOWELL SCHLUMBERGER S.A. [FR/FR]; 50, avenue Jean Jaurès, F-92120 Montrouge (FR).

(72) Inventors: PARLAR, Mehmet; 5451 Santa Chase Lane, Sugar Land, TX 77479 (US). PRICE-SMITH, Colin; 3622 Double Lake Drive, Missouri City, TX 77459 (US).

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

A3

(54) Title: FILTER CAKE CLEANUP AND GRAVEL PACK METHODS FOR OIL BASED OR WATER BASED DRILLING FLUIDS

WO 01/61148

(57) Abstract: A method is disclosed of gravel packing a wellbore which has at least one aperture therein that provides a fluid flow path between the wellbore and an adjacent subterranean formation. At least a part of the formation adjacent to the open hole has a filter cake coated thereon that comprises a water and oil emulsion. The method of gravel packing comprises injecting into the wellbore a gravel pack composition that comprises gravel and a carrier fluid. The carrier fluid comprises an aqueous liquid having a pH that is outside the range at which the filter cake emulsion is stable. The aqueous liquid is present in an amount effective to invert the water in oil emulsion in the filter cake when the carrier fluid comes into contact with the filter cake. As a result, gravel is deposited at or adjacent to the aperture in the wellbore and some of the filter cake is removed. The remainder of the filter cake and the carrier fluid can be broken simultaneously by contact with a breaker fluid that contains at least one of a surfactant and a mutual solvent.

BEST AVAILABLE COPY

INTERNATIONAL SEARCH REPORT

International Application No
PCT/EP 01/01697

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 E21B37/08 E21B37/06

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 E21B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X, P	US 6 143 698 A (SHARP KEITH W ET AL) 7 November 2000 (2000-11-07) column 3, line 6 - line 12 column 4, line 61 -column 5, line 6 column 8, line 7 - line 43; claims 16-20 ---	1
X, P	WO 00 40667 A (SCHLUMBERGER TECHNOLOGY CORP) 13 July 2000 (2000-07-13) page 5, line 25 -page 6, line 12	1, 7, 16
Y	page 7, line 6 - line 20; claims 16, 17, 25-29, 37, 40 ---	1, 7, 8, 16-19
Y	GB 2 338 254 A (SOFITECH NV) 15 December 1999 (1999-12-15) cited in the application page 2, line 20 -page 3, line 25 ---	1, 7, 8, 16-19



Further documents are listed in the continuation of box C



Patent family members are listed in annex.

* Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority, claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

T later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

X document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

Y document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

& document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
23 November 2001	03/12/2001
Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel: (+31-70) 340-2040, Tx. 31 651 epo nl. Fax: (+31-70) 340-3016	Authorized officer Boulon, A

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/EP 01/01697

Patent document cited in search report	Publication date		Patent family member(s)	Publication date
US 6143698	A 07-11-2000		US 6131661 A AU 1928299 A BR 9815979 A EP 1109875 A1 GB 2357538 A NO 20010582 A WO 0008112 A1	17-10-2000 28-02-2000 02-05-2001 27-06-2001 27-06-2001 02-02-2001 17-02-2000
WO 0040667	A 13-07-2000		US 6140277 A AU 3113400 A NO 20013280 A WO 0040667 A1	31-10-2000 24-07-2000 29-08-2001 13-07-2000
GB 2338254	A 15-12-1999	US	6263967 B1	24-07-2001